

WHAT IS CLAIMED IS:

1 1. A method for configuring lightpaths within an optical network, comprising:
2 storing a plurality of requests for a lightpath between a source node in the
3 optical network and a destination node in the optical network in a queue at the source node;
4 receiving a token at the source node of the optical network indicating an
5 available space within a wavelength;
6 selecting a request from the plurality of requests in the queue of the source
7 node responsive to a best fit window protocol; and
8 establishing, responsive to selection of the request, the lightpath between the
9 source node and the destination node.

1 2. The method of Claim 1, wherein the step of establishing further comprises the
2 step of:
3 updating the token to indicate the wavelength supporting the lightpath is
4 unavailable; and
5 forwarding the updated token to the destination node.

1 3. The method of Claim 1, wherein the step of selecting further comprises the
2 steps of:

3 comparing the space available on the wavelength to the plurality of requests
4 within the queue of the source node; and

5 selecting a request having a longest span from the queue that fits within the
6 space available on the wavelength.

1 4. The method of Claim 1, wherein the step of selecting further comprises the
2 steps of:

3 determining whether a soft deadline associated with any request in the queue
4 has expired;

5 removing any request having an expired soft deadline from the queue; and

6 selecting a removed request having an oldest expired soft deadline that fits
7 within the space available on the wavelength.

1 5. A method for configuring lightpaths within an optical network, comprising:
2 receiving a token at a source node of the optical network indicating an
3 available space within a channel;
4 determining whether a soft deadline associated with any request in a queue at
5 the source node has expired;
6 if a soft deadline has expired, selecting a request having an oldest expired soft
7 deadline that fits with an available space within the wavelength;
8 if a soft deadline has not expired, comparing a space available on a
9 wavelength to each request within the queue of the source node;
10 selecting a request having a longest span from the queue that fits within the
11 available space on the wavelength; and
12 establishing the lightpath between the source node and the destination node.

1 6. The method of Claim 5, wherein the step of establishing further comprises the
2 step of:
3 updating the token to indicate the wavelength supporting the lightpath is
4 unavailable; and
5 forwarding the updated token to the destination node.

1 7. The method of Claim 5, further including the step of storing a request in the
2 queue of the source node.

1 8. An optical network, comprising:
2 a source node;
3 a destination node interconnected with the source node by a plurality of
4 wavelengths, each wavelength associated with a particular channel;
5 a token associated with each of the plurality of wavelengths and indicating
6 availability of the associated wavelength for supporting a lightpath; and
7 wherein the source node is configured to:
8 store a request for a lightpath between the source node in the optical network
9 and the destination node in the optical network at the source node;
10 receive a token at the source node of the optical network indicating an
11 available space within a wavelength associated with the token;
12 select a request from the queue of the source node responsive to a best fit
13 window protocol; and
14 establish responsive to selection of the request, the lightpath between the
15 source node and the destination node.

1 9. The optical network of Claim 8, wherein the source node is further configured
2 to:
3 update the token to indicate the wavelength supporting the lightpath is
4 unavailable; and
5 forward the updated token to the destination node.

1 10. The optical network of Claim 8, wherein the source node is further configured
2 to:
3 compare the space available on the wavelength to each request within the
4 queue of the source node; and
5 selecting a request having a longest span from the queue that fits within the
6 space available on the wavelength.

1 11. The optical network of Claim 8, wherein the source node is further configured
2 to:
3 determine whether a soft deadline associated with a request in the queue at the
4 source node has expired;
5 removing any request having an expired soft deadline from the queue; and
6 selecting a removed request having an oldest expired soft deadline that fits
7 within the space available on the wavelength.

1 12. The optical network of Claim 8, wherein the source node is further configured
2 to store the request in the queue of the source node.

1 13. A node within an optical communication network, comprising:
2 a transmitter for transmitting to other nodes within the optical
3 communications network;
4 a receiver for receiving data from the other nodes within the optical
5 communication network;
6 a queue for storing requests for connections between the node and a
7 destination node; and
8 a controller, said controller configured to:
9 store a request for a lightpath in the queue between the node in the
10 optical network and the destination node in the optical network;
11 receive a token from the receiver indicating an available space within a
12 wavelength;
13 select the request from the queue responsive to the token using a best fit
14 window protocol; and
15 establish responsive to selection of the request, the lightpath between
16 the node and the destination node using the transmitter.

1 14. The node of Claim 13, wherein the controller is configured to:
2 update the token to indicate the wavelength supporting the lightpath is
3 unavailable; and
4 forward the updated token to the destination node using the transmitter.

1 15. The node of Claim 13, wherein the controller is further configured to:
2 compare the space available on a channel to each request within the queue;
3 and
4 select a request having a longest span from the queue that fits within the space
5 available on the wavelength.

1 16. The node of Claim 13, wherein the controlled is further configured to:
2 determine whether a soft deadline associated with any request in the queue has
3 expired;
4 remove any request having an expired soft deadline from the queue; and
5 select an oldest removed request that fits within the space available on the
6 wavelength.